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NiceZyme View of ENZYME: EC 2.3.2.13

Official Name

Protein-glutamine gamma-glutamyltransferase.

Alternative Name(s)

Fibrinoligase.

TGase.

Transglutaminase.

Reaction catalysed

Protein glutamine + alkylamine \rightleftharpoons protein N(5)-alkylglutamine + NH₃

Cofactor(s)

Calcium.

Comment(s)

The gamma-carboxymide groups of peptide-bound glutamine residues act as acyl donors, and the amino-groups of protein- and peptide-bound lysine residues act as acceptors, to give intra- and intermolecular N(6)-(5-glutamyl)lysine crosslinks.

Human Genetic Disease(s)

Autosomal recessive
lamellar ichthyosis (LI) MIM:242300

Factor XIII deficiency MIM:134570

Nonbullous congenital
ichthyosiform
erythroderma (NCIE) MIM:242100

Cross-references

PROSITE PDOC00473

BRENDA 2.3.2.13

PUMA2 2.3.2.13

PRIAM enzyme-
specific profiles 2.3.2.13

Kyoto University
LIGAND chemical
database 2.3.2.13

IUBMB Enzyme
Nomenclature 2.3.2.13

IntEnz 2.3.2.13

MEDLINE Find literature relating to 2.3.2.13



ENZYME: 2.3.2.13

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Entry EC 2.3.2.13 Enzyme

Name protein-glutamine gamma-glutamyltransferase;
transglutaminase;
Factor XIIIa;
fibrinoligase;
fibrin stabilizing factor;
glutamylpeptide gamma-glutamyltransferase;
polyamine transglutaminase;
tissue transglutaminase;
R-glutamyl-peptide:amine gamma-glutamyl transferase

Class Transferases
Acyltransferases
Aminoacyltransferases

Sysname protein-glutamine:amine gamma-glutamyltransferase

Reaction protein glutamine + alkylamine = protein N5-alkylglutamine + NH3
[RN:R03983]

Substrate protein glutamine [CPD:C02583]
alkylamine [CPD:C01664]

Product protein N5-alkylglutamine [CPD:C03636]
NH3 [CPD:C00014]

Cofactor Calcium [CPD:C00076]

Comment Requires Ca²⁺. The gamma-carboxamide groups of peptide-bound glutamine residues act as acyl donors, and the 6-amino-groups of protein- and peptide-bound lysine residues act as acceptors, to give intra- and inter-molecular N6-(5-glutamyl)-lysine crosslinks. Formed by proteolytic cleavage from plasma Factor XIII

Pathway PATH: map04610 Complement and coagulation cascades
PATH: map05040 Huntington's disease

Ortholog KO: K00686 protein-glutamine gamma-glutamyltransferase
KO: K03917 coagulation factor XIII A1 polypeptide
KO: K05625 transglutaminase 2

Genes

HSA: 116179(TGM7) 2162(F13A1) 2165(F13B) 343641(TGM6) 7047(TGM4)
7051(TGM1) 7052(TGM2) 7053(TGM3) 9333(TGM5)
MMU: 14060(F13b) 21816(Tgm1) 21817(Tgm2) 21818(Tgm3) 241636(Tgm6)
331046(Tgm4) 74145(F13a1) 74176(Tgm5)
RNO: 56083(Tgm2) 60327(F13a) 60335(Tgm1) 64679(Tgm4)
BTA: 281528(TGM2) 407997(TGM1)
DRE: 323856
DME: CG7356-PA(CG7356)
BSU: BG10946(tgl)
BHA: BH3970(tgl)
BAN: BA4173
BAR: GBAA4173
BAA: BA_4644
BAT: BAS3875
BCE: BC3963
BCZ: BCZK3723(tgl)
BTK: BT9727_3708(tgl)
BLI: BL02523(tgl)